

THE DIPTERA OF KATOOMBA. PART 2.

LEPTIDAE AND DOLICHOPODIDAE

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(Nine Text-figures.)

[Read 26th November, 1958.]

Synopsis.

Keys, discussions and descriptions concern chiefly, in Leptidae, *Dasyomma flava* Hardy and, in Dolichopodidae, *Heteropsilopus squamifer* and *Sciapus tumidus*, n. spp. The females of *Arachnomyia longipes* and *Sympycnus separatus* Parent are described, and some errors found in literature are corrected.

INTRODUCTION.

The late O. Parent, publishing on Australian Dolichopodidae (1913-55), did not realize how variable were the characters used in his descriptions, and the subsequent attempts to identify from these have led to difficulties not foreseen by him. However, he examined many of the types of early authors, confirming much synonymy previously deduced from descriptions (Hardy, 1930), and he reduced to synonymy some of his own names.

Most types of the Australian species are in the collection of the C.S.I.R.O., Canberra, and I am indebted for much information concerning these received, with grateful thanks, through Dr. A. J. Nicholson, who also supplied the number of specimens that were collected by the late A. L. Tonnoir.

Family LEPTIDAE.

Five genera were included under Leptidae by White (1914) but *Metoponia* (Hardy, 1919) was removed to Stratiomyiidae and two other genera were added. The inclusion of *Clesthena* White* was questioned (Hardy, 1921), leaving five genera only.

In a suggested new classification for the lower Brachycera (Steyskal, 1953) two of these five genera, *Atherimorpha* and *Austroleptis*, were removed to Erinnidae (Xylophagidae) and this transfer was discussed (Hardy, 1955). It is anticipated that these two small families, Leptidae and Erinnidae, will become subfamilies under one family unit when the world's fauna becomes better understood. Three Australian genera remain in the restricted unit, namely *Spaniopsis*, *Dasyomma* and *Chrysopilus*.

From the Blue Mountains only two species have been recorded, *Dasyomma flava* Hardy (Blackheath) and *Spaniopsis clelandi* Ferguson (Wentworth Falls); three more species are added below.

Key to genera and species of Leptidae.

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|--|-----------------------------------|
| 1. Venation of wing complete: M_3 reaches the wing border | 2. |
| Venation incomplete: M_3 reduced to a spur vein or absent. Anal cell closed. Abdomen conical | SPANIOPSIS. 3. |
| 2. Anal cell open at wing border. Abdomen conical | DASYOMMA. 5. |
| Anal cell closed. Abdomen long and slender, tapering or about parallel-sided | <i>Chrysopilus aequalis</i> Walk. |

* *Clesthena aberrans* White, found only on windows, was described as from both sexes, but in the various collections in Australia only female specimens were to be seen. Some of these look like possible males because of abdominal shrinkage, and as White only used a hand lens when describing Diptera, this shrinkage may have deceived him, and he states that no difference occurs between the sexes. White's type male specimen needs investigation. A male before me (13th January, 1955) has its hypopygium somewhat upturned (probably displaced), conical with a pointed apex and is certainly Asiloidean in affinities. This specimen was captured in the bush by sweeping in the Hobart suburb of Taroom and is the only male specimen that I have seen.

3. Wings with the radial field area fuscous from the stigma to the wing tip. Antennae with the style about one and a half times the length of the three segments *S. marginipennis* Ferg.
Wings entirely hyaline 4.
4. Antennae with the unsegmented style about twice the length of the three segments combined *S. longipennis* Ferg.
Antennae with the style about the length of the three segments combined .. *S. clelandi* Ferg.
5. Legs dusky brown and the abdomen black on the male (the only sex known). (Coastal area) *D. abdominalis* Hardy.
Legs bicoloured on both sexes. Abdomen black on male and normally yellow on female. (Mountain area) *D. flava* Hardy.

CHRYSOPILUS AEQUALIS Walker.

Leptis aequalis Walker, 1848; Hardy, 1919 (*Chrysopilus*).

Hab.—Katoomba: occasional specimens occur around swamps from October to December.

SPANIOPSIS MARGINIPENNIS Ferguson, 1915.

Hab.—Katoomba: 1 ♀, 21.4.1958.

Note.—This specimen was carried onto the veranda and became trapped at a window there. Sweeping shrubs in the area failed to yield more specimens, and the presence of this species in the Blue Mountains was quite unexpected. Ferguson records it from Gosford and Milson Island, occurring in May and June, and he gave the date five weeks later than the present record.

SPANIOPSIS LONGIPENNIS Ferguson, 1915.

Hab.—Katoomba: 1 ♀, 30.1.1955.

Note.—This is the only specimen found, and occurred in company with *S. clelandi*, along the creek that runs to Minna-Ha-Ha Falls.

SPANIOPSIS CLELANDI Ferguson, 1915.

Hab.—Katoomba, numerous females are scattered from December to early April, but no males have been found. These flies occur widely and regularly but not concentrated in large numbers. They appear most frequently along mountainside seepage areas.

Genus DASYOMMA Macquart.

This genus seems to have species that are very variable in their colour characters, but material so far collected is very scanty. The Tasmanian specimens have hairy eyes, and mainland ones have them bare. The Tasmanian *D. similis* Hardy, 1919, was found recently on Mt. Wellington (1 ♂, 12.1.1953, 1 ♀, 8.1.1953), adding to the scanty material previously known.

From the mainland comes one species, a female from Blackheath, but the additional material found at Katoomba indicates that the sexes are dimorphic and there is a considerable variation in the colour pattern.

Malloch (1932) gives twelve specific names for South American specimens, nine of them under new names (five species are based on unique specimens) without attempting to ally the sexes. Under his grouping the Australian species come into the typical *Dasyomma*, one of the three subgeneric groups proposed.

DASYOMMA FLAVA Hardy, 1933. (Text-fig. 1.)

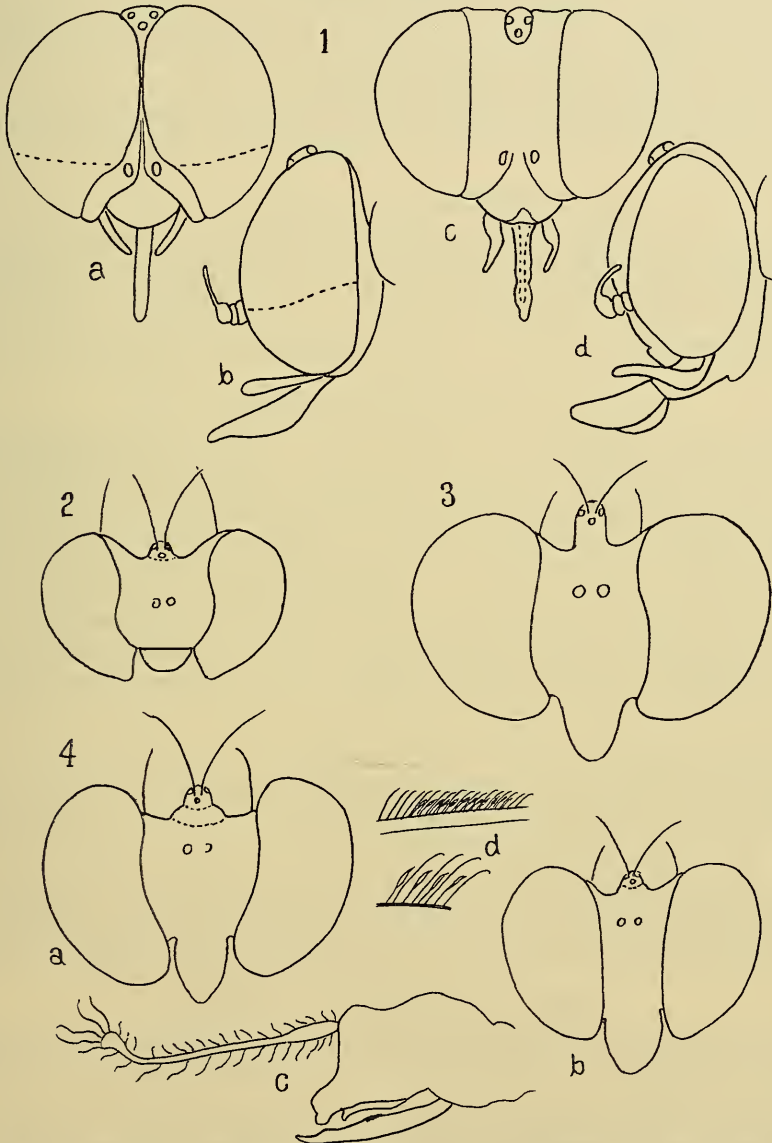
♂. Eyes bare, contiguous and with a well-defined line separating the small facets below antennal level from the enlarged ones above. The face and triangular area of frons, extending to the postocular region, are black-brown covered with a pulverulent grey.

Thorax deep brown with black hairs and its pleura is black, varying to brown, with long dark propleural hairs. Hairs on the mesopleura and metapleura are arranged in a row of about seven each. The abdomen is entirely black with black hairs.

The coxae are black, this colour extending normally to the basal third of the femora of the first two legs, and two-thirds of the hind femora, but varies to having the colour restricted to the base of them all. The apex of the femur and the whole

of the tibiae are black. Each tarsal segment is black apically and the two last may be entirely black. Elsewhere the legs are yellow. Light slender hairs occur on the anterior coxae, dark ones on the intermediate, and there is an apical row of densely packed bristly hairs on the hind coxae. One apical spine usually occurs on all tibiae of both sexes, whilst a second very small spine, when present, is not very noticeable.

The wings are slightly grey with a faintly yellowish stigma, this latter colour extending basally on the wing membrane.



Text-fig. 1.—*Dasyomma flava* Hardy. Head, (a) front view, (b) side view of male, (c) front view and (d) side view of female.

Text-fig. 2.—*Parentia tricolor* Walker. Head of male.

Text-fig. 3.—*Heteropsilopus cingulipes* Walker. Head of male.

Text-fig. 4.—*H. squamifer*, n. sp. (a) Head of male, (b) head of female, (c) hypopygium, and (d) the two rows of hair fringes, hooked and spatulate, that extend full length of the intermediate tarsi.

♀. Similar to the male, but the thorax and abdomen are yellow-brown. The head is similarly coloured with the frons as wide as an eye-width, parallel-sided. A conspicuous groove extends from the black-brown ocellar tubercle to the slightly bulging triangular area just above the antennae.

Hab.—Katoomba: Allotype male (7.2.1957), paratype male (15.12.1957) and two females (24.12.1956, 8.2.1957) form the basis of the above description, whilst other specimens yield the variations in characters recorded. The latter bear on the label the following dates: 1 ♀ (24.1.1956) which has the summit of the head slightly collapsed, the abdomen blackish (presumably stained) and shrunken; 1 ♂ (6.12.1953), 1 ♀ (11.1.1952) which are normal in colour except that the femora have little black on them, and the specimens are somewhat dilapidated.

These seven specimens were collected from windows, but a search in the neighbourhood on swamps, seepage areas, creeks, waterfalls and rocks has failed to yield more specimens.

Family DOLICHOPODIDAE.

Six specific names have been applied to species from the Blue Mountains area, namely, *Diaphorus intactus* and *Sciopus plumifer* (= *ingenuus* Erich.) from Springwood; *Condyllostylus amoenus* (= *nigropilosus* Macq.) from Mt. Victoria (all in Becker, 1922). To these were added *Sciopus ingenuus* Erich. and *Heteropsilopus cingulipes* Walk. (Hardy, 1930, 1951). Parent (1932) added *Sympycnus callidus* Par. from Mt. Wilson.

Subfamily CHRYSOSOMATINAE.

A satisfactory classification for Australian species of the Dolichopodidae has not yet evolved, and the papers by the late O. Parent followed the general plan that Becker used. This results in closely related species being placed in different genera of the Chrysosomatinae, and some in *Condyllostylus*, which does not occur in the Australian region. The genus *Chrysosoma* is a complex of species well represented in the tropical regions, and is unknown in the Katoomba area. *Heteropsilopus* extends more widely and appears to form a homogeneous group that extends to Africa (*C. petersi* and *C. bacchi* Dyte, 1957 (*Ent. mon. Mag.*, 93: 37) conform in wing character and type of terminalia—see Hardy, 1953, *ibid.*, 89: 7). *Sciapus* is another complex genus covering some of the species originally placed under *Condyllostylus*, the remainder of which are now placed in *Parentia*.

Key to Genera.

1. Male with hook-shaped cilia along the costa of the wing and the first radial vein reaches level with or beyond the apex of the median cell. Female normal in these respects. Two pairs of apical scutellar bristles in both sexes PARENTIA.
Male with normal cilia along costa and the first radial vein is short, conforming with the female in these characters 2.
2. Median cross-vein of wings strongly sinuous, often angulated and with a spur vein. One pair of apical scutellars but a second very weak pair may occur HETEROPSILOPUS.
Median cross-vein straight or slightly bowed. In a few species very slightly sinuous. One or two pairs of apical scutellar and occasionally discal bristles occur SCIAPUS.

PARENTIA TRICOLOR Walk. (Text-fig. 2.)

Psilopus tricolor Walker, 1835; Hardy, 1935 (*Parentia*) (synonymy). *Psilopus nigropilosus* Macquart, 1847; Hardy, 1935 (*Parentia*) (references). *Condyllostylus amoenus* Becker, 1922.

Synonymy.—Parent found that the type of *gemmans* Walker, 1849, conforms with *amoenus* Becker, 1922, and that the type of *tricolor* Walker, 1835, was missing. The description under the last name suggests that *tricolor* will be given precedence, but at present it is not certain that specimens under the name *nigropilosus* also include a second species to which one of the synonyms may apply.

Hab.—Katoomba: 1 ♂, 25.9.1955. This species is widely distributed from Tasmania to New South Wales and, under the name *gemmans* Walker, from Western Australia too, but apparently it is not often found in mountainous regions.

Genus HETEROSILOPUS Bigot.

Bigot, 1859; Hardy, 1935, 1951.

The three species that occur in the Katoomba area are discussed below and are readily identified on the male by characters contrasted in the key. The females conform in wing characters with the males and can be readily allied, in so far as the ocellar tubercle gives a good guide to affinities where there may be some doubt.

Key to species.

1. Male with a complete row of hook-shaped cilia, about as long as the tarsal width, on the tarsi of the middle leg 2.
The tarsi of the middle leg on male peculiarly formed; the two apical segments (often appearing as one) flattened and bearing bristly hairs. The hypopygial tergite contains a hook-shaped part on the short process. Both sexes have the wing marks reaching to, or near to, the wing tip, at least as far as the apex of the middle radial branch, though pale on newly emerged specimens. Ocellar tubercle normal in form *ingenuus* Erichson.
 2. Male with a row of flattened, scale-like, hairs, adjacent to the cilia, along the full length of the tarsi. Without an adjunct to the process of the hypopygial tergite. Wing marks vary with age from clear wings (newly emerged) to banded, but not reaching the wing tip. An occasional exception in very old specimens shows a faint shadowing reaching near to the tip. The ocellar tubercle is small, appearing like a small dome mounted on a large one *squamifer*, n. sp.
- Male without scale-like hairs adjacent to the cilia of the tarsi. Tergite of hypopygium with a long prolongation of the process. On both sexes the wings are hyaline, and the ocellar tubercle is very high and slender *cingulipes* Walker.

HETEROSILOPUS CINGULIPES Walker. (Text-fig. 3.)

Psilopus cingulipes Walker, 1835; Hardy, 1935 (references and synonymy) (*Heteropsilopus*).

Parent records that Walker's species is missing, and so the type is of uncertain identity. Notwithstanding this, the form had been identified as identical with the species which is normally found around Sydney and has the clear wings, as well as agreeing with the description in other respects. The identity seems certain, but not so all the synonymy so far applied.

It seems impossible to separate from descriptions those synonyms confirmed by Parent, of which *sydneyensis* Macq. is the earliest published name, but it must be noted that a difference occurs in the illustrations given by Becker and by Parent.

Synonymy.—In the notes below, the synonymy is clarified respecting *plumifer* Becker, the description and illustrations being evidently based upon a complex that proved difficult to resolve. In addition, doubt may arise concerning *angulosa* Bigot, 1890, and *metallicum* Parent, both of which are given as 6 mm. in length, whereas the normal variation in size for the present form is 7 to 8 mm. The 6 mm. is not outside possible variation for the species, and no other known form seems to be in agreement with the descriptions, so as to permit removal of those two names.

Hab.—Katoomba: 1 ♂, 31.10.1955. Other specimens examined are from the Sydney area. The species seems to be rare on mountains. The records give New South Wales, the Federal Capital Territory and Victoria. Macquart gives Tasmania, but that was an error, and probably should have been Sydney.

HETEROSILOPUS SQUAMIFER, n. sp. (Text-fig. 4.)

Sciopus plumifer Becker, 1922, in part (wing figure 184); Hardy, 1935 (*Heteropsilopus*). *Heteropsilopus cingulipes* Hardy, 1951, in part.

Synonymy.—Becker erected the species *plumifer* on a complex found to correspond with *ingenuus*. In 1952, another species agreeing with Becker's species regarding the wing figure was found to have a clear-winged form and cilia of the middle tarsi as on *cingulipes*. A careful survey of very long series collected over several years showed this new species *squamifer* was consistent in certain characters, showing a contrast with both forms with which it had been confused, and these characters are given in the key above.

Becker's figure 183 is that of *ingenuus*, but missing (? hidden) the hook-shaped process, and no mention is made of the middle tarsi in the description. The series of

5 ♂ and 2 ♀ is sufficient to contain the two species which are common and occur together.

Description.—A blue-green metallic species, varying with some coppery colour and with a reflecting, slight silvery, overlay, has abdominal cross-bands both basal and apical on the male, and only apical on the female. At least the two basal segments of the antennae, the mouth, most of the legs and the black-tipped lamellae are yellow. The front coxae are yellow, the others are metallic. The tarsi are fuscous, which colour extends onto the hind tibiae of the male, but if occurring there as a separate band this does not exceed half the tibial length.

The wings vary from clear on newly emerged specimens to deeply marked, including two bands crossing the area, as in Becker's figure 184, and other markings are also similar. The bands may be complete, fragmentary, very pale, but never joined together. The marking may tend to extend along the costa towards the apex, but if so it is only like a slight shadow in that area, and occurs on old specimens and may deepen a little after death.

One pair of black bristles occurs, with a slightly shorter one on the summit near by on the male; the latter bristle is very short on the female. Hairs behind the eyes are white. Thoracic bristles are not consistent in arrangement, but normally 4 acrostichal (any additional ones are weak); 3 anterior dorsals; 1 each humeral and posthumeral; 3 notopleural; 1 supraalar, which may be absent; 1 postalar and 1 scutellar pair. Submarginals of the abdomen are few and rather long, and all hairs are white except on the legs, where they form black cilia in rows with an occasional one outstanding and bristle-like. The femora are without bristles, but the tibia of the middle leg has them, about 3 on male and 10 on female being discernible. On the male the middle tarsi have a row of hook-shaped hairs that spread to, and grade down in length on, the tibia, and a row of adjacent flattened scale-like hairs which are pointed apically are limited to the tarsi.

Hab.—Katoomba: 36 ♂ and 36 ♀ form the type series. In addition about 40 more of each sex have been examined. These occurred over several years, the 14th December and 1st February being the first and last dates of capture during the 1955-6 season. Flood rains followed, ending in a short drought in 1956, when the 1956-7 season became due. Few of these flies were seen during the last few days of December, then again were missing from their haunts until the middle of January, lasting to the 1st March, 1957, but were not plentiful as in previous years.

Sydney: In the Australian Museum is a male specimen labelled "Northbridge, 19. Oct. 1924 (B. Bertram)", bearing the typical wing marks and conforming in terminalia.

Note on figures.—The drawing of the hypopygium was made from a slide-mounted specimen. Occasionally on drying the filaments become distorted and do not show the true shape, and the outline of the short process may vary slightly in shape. The filaments shown may be varied to slightly wider, but in form they resemble those of *H. cingulipes*; those of *H. ingenuus* are much broader and a little shorter. The process on the latter species (Text-fig. 7) is shown here with the hook-shaped adjunct which is missing in the figure given by Becker, but which gives the filaments correctly formed.

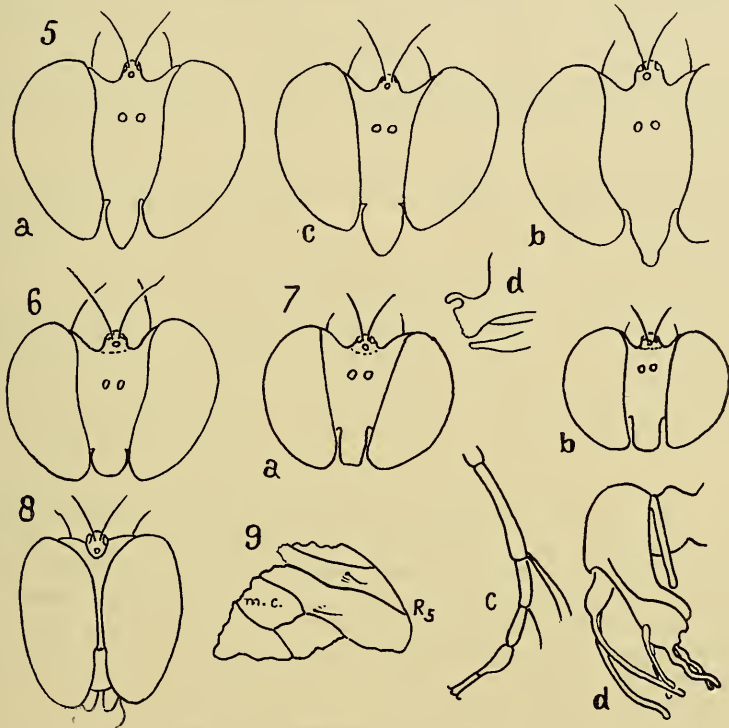
HETEROPSILOPUS INGENUUS Erich. (Text-fig. 5.)

Psilopus ingenuus Erichson, 1842; Hardy, 1930 (*Sciapus*) (references); Hardy, 1935 (references), 1951 (*Heteropsilopus*). *Psilopus trifasciatus* Macquart, 1849; White, 1916 (*Sciapus*); Parent, 1932c, 1933 (*Sciopis*); Becker, 1922 (*Chrysosoma*); Parent, 1932a (*Chrysosoma*); Hardy, 1935, 1951 (*Heteropsilopus*). *Sciopis plumifer* Becker, 1922, in part, Fig. 183 (terminalia). *Sciopis gloriosus* Parent, 1932a.

Synonymy.—Two species involved under *plumifer* Becker include the description and figure of the terminalia which correspond with the present species, on which the wing markings tend to vary. The normal markings are those given in Macquart's figure, but Parent redrew from Macquart's specimens, giving a very expansive pattern,

not known on recent specimens so far seen. Possibly Parent's figure was drawn from another species and wrongly named. Parent's other figures correspond with his *gloriosus*, which is a synonym of *trifasciatus* acknowledged by him.

Hab.—Widely distributed over Tasmania to New South Wales and South Australia. It is very abundant throughout the Blue Mountains, and the dates of capture at Katoomba are from 4th November to the 8th March, but during the retarded season ending in 1957 the last found was on 10th April.



Text-fig. 5.—*Heteropsilopus ingenuus* Erichson. (a) The normal form of the face and frons, (b) the abnormally wide variation of the same, (c) the female head, (d) the hook-shaped extension on the process of the hypopygium.

Text-fig. 6.—*H. proximus* Parent. Head of male.

Text-fig. 7.—*Sciopus tumidus*, n. sp. (a) Head of male, (b) head of female, (c) intermediate tarsi of male, and (d) hypopygium.

Text-fig. 8.—*Arachnomysia longipes* Parent. Head of male.

Text-fig. 9.—*Sympycnus anomalipennis* Becker. Part of the underside of the wing showing the position of hairs each side of the vein R_5 . m.c.: median cell.

Genus *SCIOPUS* Zeller.

Sciopus of authors.

Parent described as new, eleven species, four on males, six on females, and only one on both sexes. He later reduced two of these names to synonymy, but in one case he may have made an error. The key to species given here covers these eleven species, and two of these, together with one new species, are found in the Katoomba area. In addition, a species runs to *mollis* (2 ♀, December, 1955) but does not agree with the description, and one runs to *nigrociliatus* (3 ♀, December, January, 1955, and January, 1957); these latter names were based on two females each, and their identity may be difficult to determine with certainty until the male is known. The new species, *tumidus*, does not agree with any description but appears to be nearest to *quadrifasciatus*.

Key to Parent's species of *Sciapus*.

1. Wings with markings. Coxa I yellow. Abdomen with basal bands on segments. Median cross-vein straight 2.
Wings without markings, at most slightly and uniformly darkened 4.
2. With five dorsocentral bristles. R_5 normal 3.
With four dorsocentral bristles. R_5 diverging at apex (= *discretifasciatus* according to Parent, but this may be an error). Queensland *genevievei* ♂.
3. Wings with markings broadly extending along costa joining the two bands (when typical, but may be reduced). New South Wales *proximus* ♂, ♀.
Wing markings reduced to four spots, two reaching the costa. New South Wales *quadrifasciatus* ♀.
4. Coxae I and II yellow, 4 dorsocentral bristles, 1 pair scutellar. Abdomen yellow at base. Median cross-vein straight. New South Wales *zonatus* ♀.
Only coxa I yellow 5.
All coxae dark. Five dorsocentrals, 2 scutellar pairs. Abdomen dark with broad basal black bands. Median cross-vein straight (= *nigrofasciatus*). New South Wales *regale* ♂.
5. Median cross-vein slightly sinuous. Abdomen dark at base 9.
Median cross-vein straight or slightly bowed. One pair of apical scutellars 6.
6. Scutellum with discal bristles present. Five dorsocentrals. Abdomen dark at base. New South Wales *chettiscutatum* ♀.
Scutellum without discal bristles 7.
7. Abdomen yellow at base 8.
Abdomen entirely dark. Four dorsocentrals. Tasmania *nigrociliatus* ♀.
8. Dorsocentrals 3, and the two radial lower veins diverging at apex. Queensland *graciliventris* ♀.
Dorsocentrals 4. Radial veins normal. New South Wales *mollis* ♀.
9. One pair scutellar bristles. Dorsocentrals 4. Abdominal segments with apical bands. New South Wales *sordidus* ♀.
Two pairs of scutellar bristles. Dorsocentrals 6. Abdomen without bands. New South Wales *difficilis* ♀.

SCIAPUS DISCRETIFASCIATUS Macquart.

Psilopus discretifasciatus Macquart, 1849; White, 1916 (*Sciapus*); Hardy, 1930 (*Sciapus*); Parent, 1932a (discussion), 1932d (synonymy) (*Sciopus*). *Sciopus depinctus* Becker, 1922. ?? *Sciopus genevievei* Parent, 1932a (probably a different species).

Synonymy.—The name *depinctus* Becker can be applied to this species with certainty, but Parent saw Macquart's specimens, and stated they were his *genevievei*, giving no other comment. The wing pattern and description given by Macquart show the wing tip is clear, whereas this is not so on Parent's form.

The distinction Parent makes between the descriptions of Becker's and Macquart's forms can have little value. This rests on size and abdominal bands. The largest *depinctus* before me is 4 mm. (4.5 in Macquart) and the thin basal bands are present. Becker gives 3 to 3.5 mm., which corresponds with specimens that have a shrunken abdomen hiding the bands, this shrinkage being quite common on pinned specimens.

S. genevievei Parent is from Eidsvold (T. L. Bancroft), which district seems too far north in Queensland for a species that appears to be confined to cooler regions, and the name is likely to prove applicable to a distinct species.

Hab.—Katoomba: a series of 25 specimens, all females, were collected between 8th November and 22nd December, 1955-6, mostly found by sweeping low vegetation, others occurring on windows and on leaves of trees.

Note.—This species, which is very common in New South Wales, is liable to have the wing pattern very pale, varying to practically clear winged. It seems curious that, so far, no males have been found in the Katoomba area, though quite common elsewhere.

SCIAPUS PROXIMUS Parent. (Text-fig. 6.)

Parent, 1928, 1933 (*Sciopus*); Hardy, 1930.

Hab.—Katoomba: 1 ♂, 21.12.1955, and 1 ♀, 18.12.1956.

Note.—The female entirely misses the broad strip that, on the male, joins the two transverse bands along the costa. It is evident that considerable variation occurs in wing pattern because the pattern is recorded by Parent as being reduced in area on the female.

SCIAPUS TUMIDUS, n. sp. (Text-fig. 7.)

Metallic green with blue and coppery reflections and with a restricted slight whitish overlay. Mouth parts and halteres yellow. All coxae metallic, except on the female the front ones are yellow. Femora yellow on female, but metallic on male with the apex and sometimes trochanters yellow. Tibia and metatarsus entirely yellow, the rest fuscous.

Dark incisions at the base of abdominal segments may occur on the male, which has the hypopygium curiously formed and may appear to differ in accord with the angle of view. The main tergite is long and the filaments are long and slightly curved. Two apical appendages are present, the upper one is like a flattened scale and the lower one is angulated, sinuous and bristle-like.

The bristles are slightly variable in the series, the rows normally having 3 acrostichals, 2 being presutural, 5 dorsocentral with the middle one very small, 1 or 2 humeral, 1 posthumeral on female, 2 notopleural and a line of 3 supraalar (possibly the intraalar is included with this), 1 postalar and 1 or 2 pairs of apical scutellar bristles. The apical bristles of the abdominal segments are not many but stand out slender, long and black on the female.

The front coxae have only light-coloured hairs, and groups of long scattered hairs are on the basal half of the femur and no bristles or long hairs occur on the tibia and metatarsus. The middle femur is similar, and the tibia may have two bristles on each dorsal, anterior, ventral and posterior surface. The male has, on the tarsi, two outstanding long hairs on the first segment, and a row of small setae, three or four of them outstanding. The second segment has a long bristle apically placed, and the third is short and slightly curved. The fourth segment is relatively long with a laterally flattened swelling on the basal half. The fifth segment is normal. On the female these tarsi are normal in form with small apical bristles. The hind legs are normal, with only apical bristles on segments, except one or two may occur on the anterior surface of the tibiae and occasionally additional small bristles.

The wings are usually quite clear on the male, only one specimen having a faint trace of marking. The female has shadow marking on cross-veins. The median cross-vein is practically straight and is $1\frac{1}{2}$ to 2 times the length of the lower median branch vein. One wing is aborted, showing a strongly bowed median cross-vein with detached ends, and is displaced in position; also the lower median branch is occasionally incomplete.

Hab.—Katoomba: 15 ♂, 14 ♀, 7th to 20th November, 1955. Nearly all these were frequenting seven small red-currant bushes in the mid-morning sunshine. Others occurred on leaves of fruit trees, and the species has not been seen at other times.

Note.—The species shows considerable variation in chaetotaxy, which is a feature liable to be greater than showing on the comparatively small series available for study.

Subfamily DOLICHOPODINAE.

When the family is divided into the eight or nine subfamilies normally adopted, no clarity is reached regarding generic relationships, so the partial rearrangement previously employed (Hardy, 1939) is adopted here, bringing Neurogoninae and Medeterinae into this subfamily. Into it come all genera, other than the Chrysosomatinae, that have the male hypopygium free, not being embedded in a prior (sixth) abdominal segment. This arrangement simplifies the taxonomy and may lead towards a better understanding of genera.

ARACHNOMYIA LONGIPES Parent. (Text-fig. 8.)

Pleuropygius longipes Parent, 1933; Hardy, 1939 (*Arachnomyia*).

♀. Agrees with the description of the male, except the narrow frons is parallel-sided; the third antennal segment is shorter, being as long as wide at base; the abdomen tapers to a slender apex and coloured as on male, except one specimen which misses the yellow at the base.

Hab.—Katoomba: 1 ♂ (31.12.1956) and 4 ♀, two dated the same, the others being 14.1.1956 and 15.1.1957.

The holotype was recorded from Victoria without other location, and these additional specimens form the allotype and paratype females. Two were found on the wall of the laboratory and a search on tree-trunks produced one other. One was on a window in the laboratory.

Subfamily SYMPYCININAE.

This is Campsiconominae of Becker, and is here extended to include all genera which have the male hypopygium appearing to be embedded in a prior segment of the abdomen. Lundbeck (1912) described it as somewhat embedded. The sixth sternite forms a slight hollow to receive it, and this arrangement leaves exposed the entrance to the genital cavity. The whole terminalia are quite symmetrically arranged.

It is not clear yet which genera of the various proposed subfamilies belong to this grouping, but probably *Raphium* Meigen, 1803, *Hydrophorus* Fallen, 1823, *Diaphorus* Meigen, 1824, and *Sympycnus* Loew, 1857, together with most of the genera associated with them, will come under one or two subfamily groups acceptable to most authors.

Genus SYMPYCUS Loew.

Synonymy.—Genus *Liparomyia* White, 1916, is possibly *Sympycnus*, as the description of *L. sedata* White is near that of *S. scitulus* Parent, also from Tasmania. White states that the hypopygium is curved forward under the venter for only a short distance and this agrees with the genus. Also it seems to run to *Sympycnus* in the key to Dolichopodidae given by van Duzee (1930), in "Diptera of Patagonia and South Chile". However, the description does not conform with any of the species described by Parent.

Becker named one and Parent sixteen species, the latter being based on a limited series in the Tonnoir collection. Fourteen are based on males only, and some defectively described, making subsequent recognition difficult. The prescutellar depression is given as absent from both Australian and New Zealand species, but all forms seen have that depression. Some defects in Parent's paper are rectified below, but others may yet be found.

Key to species recorded from New South Wales.

These nine forms have the normal six dorsocentral bristles, and the approximate proportion of the median cross-vein, given in parentheses, is based on ten units for the lower branch of the median field, such as (6:10), but slight variations may occur.

1. Male with abnormal wing venation (3:10). Two hairs, or patches of hairs, occur on the membrane, about level with the median cross-vein, one each side of the radial sector on the under side of the wing. Female with normal wing venation (10:10). Both sexes have a greenish-blue median thoracic stripe which occasionally may be a little obscure. Without acrostichal bristles. Abdomen partly yellow. Third antennal segment little longer than its maximum width. Front tarsi and tibia equal in length *anomalipennis* Becker.
- Wing venation normal on both sexes, and without the blue median thoracic stripe 2.
2. Species largely yellow and without acrostichal bristles. Front tarsi little longer than tibia 3.
- Species metallic or dull coloured 4.
3. Wings black at apex on male, clear on female (5:10). Abdomen dark with yellow side-spots *marginatus* Par.
- Wings clear on both sexes (8:10). Abdomen yellow with broad black cross-bands *callidus* Par. ♂.
4. Without acrostichal bristles (6:10) 5.
- With acrostichal bristles. Metallic species 6.
5. Thorax metallic blue. Third antennal segment short. Front tarsi $1\frac{1}{2}$ times longer than tibia *setifemoratus* Par. ♂.
- Body entirely brown, varying to black in parts. On male the third antennal segment is twice maximum width, short on female. Front tarsi little longer than tibia. Eyes below antennae contiguous on male, narrowly separated on female *separatus* Par.
- Brown species with blue frons and some yellow on the second abdominal segment or more. Eyes separated on face. Third antennal segment short. Base of middle femur on male with a group of outstanding hairs, sometimes tuft-like. Front tarsi slightly longer than tibia *allectorius* Par.
6. Front tarsi $1\frac{1}{2}$ times the length of tibia 7.
- Front tarsi almost twice the length of tibia (6:10) *infimus* Par. ♂.

7. Front metatarsus distinctly more than half the total tarsal length, and with a small apical projection (8:10) *claudicans* Par. ♂.
 Front metatarsus only half the tarsal length, and without the apical projection (12:10) *capilliger* Par. ♂.

Three species in the key occur at Katoomba, and amid other forms not identified is a new species near *S. praecipuus* Becker (New Guinea).

The two figures of *anomalipennis* given by Becker and by Parent would suggest that two species are standing under the name. Marked differences occur in these drawings regarding the venation. The veins may alter slightly, but none have been found with the venation as given by Becker, where the longitudinal veins appear to be misplaced. Possibly the hairs on the wing membrane, a new character, may help to isolate the males if two forms have been incorporated.

SYMPYCNUM ANOMALIPENNIS Becker. (Text-fig. 9.)

Becker, 1922; Hardy, 1930; Parent, 1932a.

Hab.—Katoomba, 2nd September to 22nd March, 1955-6.

This is quite a common species widely distributed over New South Wales, and occurs even in winter. It is plentiful at Katoomba during November.

SYMPYCNUM ALLECTORIUS Parent, 1932a.

Correction.—A letter from Dr. A. J. Nicholson confirms the view that the holotype has aborted front tarsi and that Parent's figure of the wing does not belong, but should have been attributed to *S. tasmanicus* Par. Seven of the nine males in the Tonnoir collection have simple front tarsi and those collected at Katoomba agree, except one has tarsi as illustrated by Parent and two are abnormal to a lesser degree.

When pinned and placed in store this species deteriorates more than normally. Disintegration takes place more readily than with the other species under conditions of the Katoomba climate. A cure was found in letting the specimens dry in the open for three or four days before storing, a treatment that greatly reduces the trend for antennae, legs and even head becoming detached. Artificial drying results in brittleness, making subsequent handling hazardous. Description of this species awaits a longer series in better condition than those now available.

SYMPYCNUM SEPARATUS Parent, 1932a.

♀. Body colour, including head and coxae, entirely dark brown, deepening to blackish in parts. Legs yellow-brown. Face narrow, normally parallel-sided and with a transverse depression. Third antennal segment very short with the arista dorsally placed.

One pair of long ocellar bristles, and another pair, shorter, on summit. About 10 postoculars and a few white hairs behind eyes. Thoracic bristles are 1 each humeral and posthumeral, 6 dorsocentrals, 2 each notopleural and intraalar, 1 each supraalar, postalar and scutellar pairs. Abdomen with long hair-like marginal bristles.

The legs have few bristles, only the apical row on front and middle, and a strong outstanding bristle on rear coxae. In addition to apicals of femora and tibiae there are only four outstanding dorsal bristles occurring on the hind tibiae.

The tarsi are simple, those of the first leg about one and a quarter, the middle about equal to, and the hind leg three-quarters of their respective tibial length. The metatarsi are respectively half, half, and one-third of their total tarsal length.

The wings have the upper median branch about parallel with the lowest radial branch, and median cross-vein proportional to the lower median branch vein is slightly over 6:10.

Hab.—Katoomba: The earliest date of collecting was 25th September, 1956, and the last in any season is dated 14th May, 1955. October and November are months of greatest abundance, and after the middle of January they become very scarce.

About 200 specimens have been examined, of which 25 per cent. are males. The females retained include the allotype and numerous paratypes. The Tonnoir collection has six males.

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* The references concerned with Leptidae have an asterisk, the remainder are concerned with Dolichopodidae.